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TITLE: APPARATUS FOR PRODUCTION OF OPTICAL PARTS, PRODUCTION OF OPTICAL PARTS AS WELL AS OPTICAL PARTS USING THE SAME AND FURTHER PROJECTION TELEVISION USING THESE OPTICAL PARTS

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ABSTRACT:

PROBLEM TO BE SOLVED: To provide an apparatus for production of optical parts featuring good productivity and a process for production of the optical parts using the same as well as the optical parts having good optical characteristics and a projection television using these optical parts.

SOLUTION: A base 3a consisting of polyethylene naphthalate, etc., is set at a feed roll 4, is guided from the feed roll 4 toward a take-up roll 6 via guide rolls 5a, 5b, 5c, 5d, 5e, 5f and is taken up on the take-up roll 6. Next, SiO2 an Nb2O5 of optical thin films of previously optically designed thin film constitution are formed by, for example, 10 layers each, total 20 layers, by alternately sputtering an evaporation source 7a of an Si target and an evaporation source 7b of an Nb target while adjusting the flow rates of gaseous Ar and gaseous oxygen and while adjusting the film thicknesses by an optical monitor 20 so as to satisfy prescribed transmittance characteristics.

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Search History

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DB Name	Query	Hit Count	Set Name
USPT,PGPB	(removv$3 same excess same (film or layer or coating) same optical)	404	L35

JPAB,EPAB,DWPI,TDBD	(remov$3 and (film or layer or coating) and overshoot$3 and optical)	3	L34
USPT,PGPB	L5 and (remov$3 same (film or layer or coating) same overshoot$3)	0	L33
USPT,PGPB	((quarter near2 wave) or (lamda near2 4)) same (desir$4 or optim$3 or advanta$5) same filter	133	L32
USPT,PGPB	L30 and filter	31	L31
USPT,PGPB	((quarter near2 wave) or (lamda near2 4)) same (desir$4 or optim$3 or advanta$5) same (optical) same ((multi near2 layer) or multilayer or (multi-layer) or ((plurality or number or several) near2 layer))	44	L30
USPT,PGPB	((quarter near2 wave) or (lamda near2 4)) same (optical filter) same (desir$4 or optim$3 or advanta$5)	6	L29
USPT,PGPB	((quarter near2 wave) or (lamda near2 4)) same ((Nb2O5 or "Nb.sub.2O.sub.5") or (SiO2 or "SiO.sub.2")) and (optical near2 filter)	19	L28
USPT,PGPB	((quarter near2 wave) or (lamda near2 4)) same ((Nb2O5 or "Nb.sub.2O.sub.5") same (SiO2 or "SiO.sub.2"))	0	L27
USPT,PGPB	((quarter near2 wave) or (lamda near2 4)) same ((Nb2O5 or "Nb.sub.2O.sub.5") same (SiO2 or "SiO.sub.2")) and (optical filter)	0	L26
JPAB,EPAB,DWPI,TDBD	thickness and (transmittance near3 decreas$3) and (optical or (multi near2 layer) or multilayer or (multi-layer) or ((plurality or number or several) near2 layer))	33	L25
USPT,PGPB	thickness same (transmittance near3 decreas$3) same (optical or (multi near2 layer) or multilayer or (multi-layer) or ((plurality or number or several) near2 layer))	43	L24
USPT,PGPB	(thickness same (measured near3 transmittance near3 decreas$3))	1	L23
JPAB,EPAB,DWPI,TDBD	(thickness same (measured near3 transmittance near3 decreas$3))	1	L22
JPAB,EPAB,DWPI,TDBD	L11 and (transmit$6 and (max or maximum or maxima or min or minimum or minima or increase$3 or decreas$3) and (terminat$3 or stop$3 or halt$3 or end$3 or finish$3))	2	L21
JPAB,EPAB,DWPI,TDBD	L11 and ((remov$3 or etch$3) near5 (film or layer or coating))	4	L20
USPT,PGPB	L14 and ((remov$3 or etch$3) near5 (film or layer or coating))	55	L19

USPT,PGPB	L14 and (transmit$6 same (max or maximum or maxima or min or minimum or minima or increase$3 or decreas$3) same (terminat$3 or stop$3 or halt$3 or end$3 or finish$3))	9	L18
USPT,PGPB	L14 and (transmit$6 near8 (max or maximum or maxima or min or minimum or minima or increase$3 or decreas$3))	63	L17
USPT,PGPB	L14 and (transmit$6 same (max or maximum or maxima or min or minimum or minima or increase$3 or decreas$3))	104	L16
USPT,PGPB	((359/580).icls. or (359/586).icls. or ((359/588)!.ICLS.)) and (((measur$3 or monitor$3) near5 transmit$6) same thickness) and ((multi near2 layer) or multilayer or (multi-layer) or ((plurality or number or several) near2 layer))	12	L15
USPT,PGPB	(((measur$3 or monitor$3) near5 transmit$6) same thickness) and ((multi near2 layer) or multilayer or (multi-layer) or ((plurality or number or several) near2 layer)) and (optic$2)	160	L14
USPT,PGPB	((measur$3 or monitor$3) same transmit$6 same thickness) and ((multi near2 layer) or multilayer or (multi-layer) or ((plurality or number or several) near2 layer)) and (optic$2)	519	L13
JPAB,EPAB,DWPI,TDBD	L11 and thickness	43	L12
JPAB,EPAB,DWPI,TDBD	((measur$3 or monitor$3) near5 transmit$6) and (layers) and (optical or mirror)	194	L11
USPT,PGPB	L5 and ((measur$3 or monitor$3) near5 transmit$6)	78	L10
JPAB,EPAB,DWPI,TDBD	((multi near2 layer) or multilayer or (multi-layer)) and ((measur$3 or monitor$3) near5 transmit$6) and optical	17	L9
USPT,PGPB	L5 and ((multi near2 layer) or multilayer or (multi-layer)) and (measur$3 near5 transmit$6)	8	L8
USPT,PGPB	L5 and ((multi near2 layer) or multilayer or (multi-layer)) and ((measur$3 near5 transmit$6) same (thickness))	4	L7
USPT,PGPB	(427/162).icls. or ((427/419.3)!.ICLS.)	938	L6
USPT,PGPB	((427/8).icls. or (427/9).icls. or ((427/10)!.ICLS.))	980	L5
JPAB,EPAB,DWPI,TDBD	(Shimoda.in. or Ohsako.in.) and sony	28	L4
USPT,PGPB	(Shimoda.in. or Ohsako.in.) and (optical near2 component)	23	L3
USPT,PGPB	(Shimoda.in. or Ohsako.in.)	602	L2
USPT,PGPB	(Shimoda.in. or Ohsako.in.) and sony	3	L1

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the projection TV which used this for the optic manufacture technique and the optic pan using the optic manufacturing installation and this which are characterized by forming an optical thin film on a base material in the reduced pressure ambient atmosphere still in detail about the projection TV which used this optic for the optic manufacture technique and the optic pan which used an optic manufacturing installation and this.
[0002]
[Description of the Prior Art] In the parts with an antireflection film, and the optic in which optical thin films, such as a dichroic mirror, were formed, in order to realize a good optical property, it is necessary to form the optical thin film of at least ten layers. An optical thin film is MgF2 of a low refractive-index material. TiO2 of SiO2 and a high refractive-index material Nb2 O5 It is constituted by the grade. The optic which forms an optical thin film and is produced by the usual batch process evaporates an optical thin film raw material by the thin film formation technique, such as vacuum evaporationo and sputtering, within a vacuum devices, forms this directly on transparent members, such as a glass substrate, and is produced. The optical property can obtain about 97% of permeability (the light source is the conditions of 45 incident angles by P polarization) on the wavelength of 525nm, as shown in the drawing 6 which is an outline state diagram having shown an example of the measurement result of the permeability property of the dichroic mirror for projection TV which formed the optical thin film directly on the glass substrate. The opposite side of the field where the optical thin film was formed in transparent members, such as a glass substrate, usually performs acid-resisting processing, and forms the antireflection film. It is difficult to restrict the space which arranges the glass substrate of a large area in a vacuum devices by the manufacture technique of the optic which forms a direct optical thin film to a glass substrate etc. within the above-mentioned vacuum devices, and to form an optical thin film in the glass substrate of a large area uniformly, and the manufacturing installation and the manufacture technique of an optic of the quantity of an optic producible at once being smallness, and having mass-production nature since using such a batch process is not avoided were desired.
[0003]
[Problem(s) to be Solved by the Invention] In view of such a trouble, as for this invention, the optic manufacture technique using the optic manufacturing installation and this with a good productivity and an optical property make it a technical probrem to offer a good optic and the projection TV using this optic.
[0004]
[Means for Solving the Problem] The delivery roll whose optic manufacturing installation of this invention winds a base material at least, rolling round with the rolling-up roll which rolls round the base material delivered from a delivery roll, and a delivery roll, providing between rolls a vaporization means to evaporate an optical thin film raw material, sending a base material to it, rolling round from a roll, and sending to a roll An optical thin film raw material is evaporated by the vaporization means which enables alternative vaporization of two sorts of aforementioned optical thin film raw materials from which a refractive index is different at least in the reduced pressure ambient atmosphere, and it is characterized by forming an optical thin film on a base material. As for **** of a delivery roll and a rolling-up roll, it is desirable to have at least 100mm diameter.
[0005] It is characterized by having the process which forms an optical thin film on a base material according to the vaporization process which enabled alternative vaporization of two sorts of optical thin film raw materials from which a refractive index is different at least in the reduced pressure ambient atmosphere, rolling it round from a roll and sending [the manufacture technique of the optic of this invention sends a base material, and] it to a roll at least. It is desirable to have the process to which the vaporization process which evaporates an optical thin film carries out 10 stratification of two sorts of optical thin films from which a refractive index is different at least by turns, respectively. It is desirable to have the process which joins a base material to transparent members, such as tabular glass, and the process which judges a base material in a predetermined configuration after the process which forms an optical thin film on a base material. It is desirable to have the process at which a transparent member forms a protection film on an adhesives layer and an adhesives layer at least before the process which forms an optical thin film on a base material at one principal plane of a transparent member. It is desirable to have the process which joins the aforementioned base material to a frame, and the process which judges a frame in a predetermined configuration after the process which forms the aforementioned optical thin film on a base material.
[0006] Setting to the manufacturing installation and the manufacture technique of an optic of this invention, for an optical thin film raw material, one side is the oxide of Si and Si, and MgF2. It is either and it is desirable that it is the optical thin film from

which at least two sorts of refractive indexes whose another side is the oxide of Ti, Nb, and Ti or Nb oxide are different. It is desirable that a vaporization means / optical thin film formation process is any one sort in a vacuum evaporation system/technique, electron-beam-evaporation equipment / technique, a sputtering system/technique, and an ion plating system/technique. In order that the means/process which forms an optical thin film may form the aforementioned optical thin film, it is desirable to have the reactant gas introduction means / process which introduces reactant gas. It is desirable that the means/process which forms an optical thin film have the pressure regulation means / process of the reduced pressure ambient atmosphere. It is desirable to have the means/process that a base material forms an adhesives layer in the opposite side of an optical thin film forming face, and forms a protection film on an adhesives layer before forming an optical thin film. Moreover, it is desirable to have the means/process that a base material forms a hard-coat layer in an optical thin film forming face beforehand before forming an optical thin film. It is desirable that base materials are any one sort of high polymer films of a polyethylene terephthalate, polyethylenenaphthalate, polymethylmethacrylate, and the polycarbonates.

[0007] It is characterized by being the optic produced using the base material which had the optical thin film produced by either the optic manufacturing installation of this invention, or the optic manufacture technique formed. As for an optic, it is desirable that it is any one sort of a dichroic mirror, an edge filter, a band pass filter, the parts with an antireflection film, and the pellicle beam splitter.

[0008] It is characterized by being the projection TV which performs color separation etc. using the dichroic mirror of the optic produced using the base material which had the optical thin film produced by either the optic manufacturing installation of this invention, or the optic manufacture technique formed.

[0009] According to the manufacturing installation of the optic of this invention, and the manufacture technique using this, on the base material of a high polymer film, it can be uniform, and an optical thin film can be formed easily continuously, and an optical property can be made good. Therefore, offer of the optic a dichroic mirror, an edge filter, a band pass filter, the parts with an antireflection film, the pellicle beam splitter, etc. excelled [optic] in the optical property, for example produced by the optic manufacturing installation of this invention and the optic manufacture technique using this is possible. If the dichroic mirror produced by the optic manufacturing installation of this invention and the optic manufacture technique using this is used, the projection TV excellent in quality of image can be offered.

[0010]

[Embodiments of the Invention] The gestalt of the operation about projection TV to the manufacturing installation, the manufacture technique, and the optic pan of an optic in which the optical thin film was formed on the base material of the high polymer film of this invention is explained below. The traveller sends the base material of a high polymer film in the vacuum devices possessing evacuation equipment, and rolls round via a guide roll from a roll as a manufacturing installation of the optic of this invention, and a roll is run by fixed speed is arranged. The base material supported by the guide roll etc. is countered and at least two sorts of evaporation sources of an optical thin film raw material are arranged. the evaporation source of an optical thin film raw material -- for example, SiO2 etc. -- Si oxide and MgF2 Inner one of low refractive-index materials, and TiO2 etc. -- Ti oxide and Nb2 O5 etc. -- the high refractive-index material of either of the Nb oxides can be used As a vaporization means, a sputtering system, a vacuum evaporation system, electron-beam-evaporation equipment, or the ion plating systems can be used. A gas introduction bulb is prepared in a vacuum devices, and you may enable it to introduce into it the reactant gas which reacts with the optical thin film raw material of a vaporization means. in this case, the thing for which Si, Ti, and Nb are used and oxygen gas is used as reactant gas as an optical thin film raw material in order to form the above-mentioned optical thin film -- respectively -- SiO2 etc. -- Si oxide and TiO2 etc. -- Ti oxide and Nb2 O5 etc. -- Nb oxide can be formed

[0011] When forming an optical thin film, first, the base material of high polymer films, such as a polyethylene terephthalate, polyethylenenaphthalate, polymethylmethacrylate, and a polycarbonate, is set to a delivery roll, and is rolled round from a delivery roll, rolling round in the orientation of a roll via a guide roll, and rolling round to it on a roll, an optical thin film raw material is evaporated to it by the above-mentioned vaporization means, and an optical thin film is formed in it at a base material. It evaporates alternatively at least two sorts of optical thin film raw materials, an optical thin film sending a base material, rolling it round from a roll, and making it it run by fixed speed in the orientation of a roll, adjusting to a predetermined thickness so that a predetermined permeability property may be fulfilled, combines ten layers of low refractive-index layers, and ten layers of high refractive-index layers, and carries out 20 stratification of the optical thin film of the thin film configuration by which the optical design was carried out beforehand. In this case, it is also possible to evaporate an optical thin film raw material alternatively, and to form it repeatedly by rolling round from the delivery roll of a base material and reversing the run to a roll by turns. It is SiOx as an optical thin film of the lowest layer directly formed in a base material. And TiOx You may form one of optical thin films. (x is two or less positive number.)

At the time of optical thin film formation, flow rates, such as Ar gas of the source of a plasma of a vaporization means and oxygen gas, can be controlled, and the pressure of the vaporization ambient atmosphere can be adjusted. You may use for the thin film forming face of a base material the thing in which the hard-coat layer was formed. Moreover, you may form a protection film before thin film formation or in the back on an adhesives layer and an adhesives layer at a base material.

[0012] As a transparent member, a glass substrate etc. is prepared, a lamination junction is carried out through adhesives at the base material which formed the optical thin film by the above-mentioned thin film deposition system, and it completes as optics, such as a dichroic mirror, an edge filter, a band pass filter, and parts with an antireflection film. A transparent member may use what formed the adhesives layer beforehand and formed the protection film on the adhesives layer. Moreover, it can join through adhesives to the base material of the high polymer film in which the optical thin film was formed, and let the frames of for

example, a circle configuration at it be optics, such as a pellicle beam splitter. The dichroic mirror produced by the manufacturing installation of the above-mentioned optic and the optic manufacture technique using this can be used for projection TV.

[0013]

[Example] An example which forms in the optic manufacturing installation, the optic manufacture technique, and the optic pan of this invention the optical thin film used for the dichroic mirror for projection TV about the example of projection TV is explained below. First, an optical thin film deposition system and the manufacture technique are explained to the base material of a high polymer film using the drawing 1 which is an outline cross section showing an example of the thin film deposition system which forms an optical thin film. The traveller sends base material 3a of a high polymer film in the optical thin film deposition system 1 possessing the evacuation equipment 2, and rolls round from a roll 4 via the guide rolls 5a, 5b, 5c, 5d, 5e, and 5f, and a roll 6 is run by fixed speed is arranged. For example, using a sputtering system as a vaporization means, as an optical thin film raw material, as evaporation sources 7a and 7b, guide roll 5d is countered and two targets of Si and Nb are arranged, respectively. Moreover, as pre-treatment equipments, such as a degasifying of base material 3a, the base material between guide roll 5a and 5b is countered, and the plasma electrode 8 is arranged. The gas introduction bulb 9 is formed in a vacuum devices, and it enables it to adjust the introductory flow rate of reactant gas, such as Ar gas and oxygen gas, in a spatter to it. Guide roll 5d, it has the structure cooled in order to prevent the temperature rise of base material 3a of a high polymer film at the time of membrane formation, although illustration is omitted.

[0014] Next, the example which forms the optical thin film applied to the dichroic mirror for projection TV using this optical thin film deposition system 1 is explained. 188 micrometers in first, thickness It sets to the delivery roll 4 and rolls round from the delivery roll 4, and base material 3a of polyethylenenaphthalate is rolled round in the orientation of a roll 6 via the guide rolls 5a, 5b, 5c, 5d, 5e, and 5f, and is rolled round on a roll 6 to it. Next, adjusting the flow rate of Ar gas and oxygen gas, the spatter of the evaporation-source 7a of the target of Si is carried out, and SiOx (x is two or less positive number) is formed in base material 3a. Next, SiO2 of the optical thin film of the thin film configuration by which the optical design was beforehand carried out, adjusting a thickness so that a predetermined permeability property may be fulfilled with the optical monitor 10, carrying out the spatter of the evaporation-source 7a of evaporation-source 7b of the target of Nb, and the target of Si by turns, and adjusting the flow rate of Ar gas and oxygen gas as shown in [Table 1] Nb2 O5 For example, it carries out ten layers at a time 20 in all stratification. (SiOx is included in SiO2.) It is set as the conditions from which the flow rate of Ar gas of a spatter and oxygen gas is adjusted by the gas introduction bulb 9, a pressure is changed, and the stress of a thin film serves as smallness again at the time of optical thin film membrane formation. For example, usual spatter conditions are SiO2 by setting this to about 1.6Pa, although a pressure is about 0.3Pa. Nb2 O5 The internal stress of the whole optical thin film can be made into smallness, adjusting the balance of stress, and curl of film-like base material 3a can be reduced. Base material 3a uses what formed the hard-coat layer in the optical thin film forming face beforehand, and formed the protection film in the opposite side of an optical thin film forming face on the adhesives layer and the adhesives layer. Base material 3a of polyethylenenaphthalate has thermal resistance, and heat deformation can form an optical thin film uniformly by the parvus's at the time of membrane formation. For example, the glass transition point of polyethylenenaphthalate is 110 degrees C, and is imagined to be what is excellent in thermal resistance compared with 69 degrees C of a polyethylene terephthalate.

[0015]

[Table 1]

層	材料	厚さ（nm）
1	SiO_x	約1
2	Nb_2O_5	98.4
3	SiO_2	144.8
4	Nb_2O_5	84.9
5	SiO_2	141.4
6	Nb_2O_5	79.2
7	SiO_2	134.9
8	Nb_2O_5	86.8
9	SiO_2	118.0
10	Nb_2O_5	84.5
11	SiO_2	134.2
12	Nb_2O_5	79.1
13	SiO_2	138.5
14	Nb_2O_5	79.9
15	SiO_2	133.6
16	Nb_2O_5	80.0
17	SiO_2	145.5
18	Nb_2O_5	81.5
19	SiO_2	127.9
20	Nb_2O_5	105.1

[0016] Next, it completes as an optic applied to the dichroic mirror for projection TV by preparing tabular glass with the width of face of 5cm, a length [of 8.75cm], and a thickness of 1mm, carrying out a lamination junction through adhesives as a transparent member, at base material 3a in which the above-mentioned optical thin film was formed, and judging base material 3a in the appearance configuration of tabular glass. A transparent member may use what formed the protection film on the adhesives layer and the adhesives layer beforehand. The optic applied to the dichroic mirror for projection TV manufactured by the above-mentioned manufacture technique is explained using the drawing 2 which is an outline configuration cross section. Base material 3a of polyethylenenaphthalate is joined by the adhesives layer 22 on the transparent member 21 of tabular glass, and hard-coat layer 3b is formed on the base material 3. SiOx 3d of the high refractive-index layers of low refractive-index layer 3c' and Nb2 O5, and SiO2 Low refractive-index layer 3c serves as the configuration by which every ten layer 20 in all layers laminating was carried out by turns. (SiOx layer is included in SiO2.)
Moreover, as shown in the outline block diagram of drawing 3 (a) and the drawing 3 (b), the optic which joined the frame 31 of a circle configuration to base material 3a in which the above-mentioned optical thin film was formed, through adhesives, and was applied to the pellicle beam splitter 30 is completed.
[0017] Next, the permeability property of the optic applied to the dichroic mirror produced by an above-mentioned manufacturing installation and the above-mentioned manufacture technique is shown in the drawing 4 and the drawing 5 . Drawing 4 shows the outline state diagram of the theoretical permeability property of the dichroic mirror formed on polyethylenenaphthalate (there shall be no reflection factor on the back in this case), and drawing 5 shows the outline state diagram of the measurement result of the permeability property of the dichroic mirror formed on the polyethylenenaphthalate joined on the glass substrate. (However, the incident angle of each light source of the drawing 4 and the drawing 5 is 45 degrees in P polarization.)
According to the measurement result of the permeability property of drawing 5 , the permeability in the wavelength of 525nm of this dichroic mirror is about 90%, and this is sufficient value as a performance required for the dichroic mirror for projection TV. In this case, in 525nm, all dispersion is 1% and general absorption is about 3%. Moreover, about 4.5% of a residual permeability loss can be reduced by making almost the same the refractive index of a high polymer film and glass. Furthermore, in this dichroic mirror, it is possible to reduce general absorption by a reduction of the absorption in a high polymer film material and reduction of the absorption in the optical thin film by optimization of an optical thin film formation process. Moreover, with the dichroic mirror for projection TV, in a 45 degrees incident angle and P polarization, rear-face reflex of a glass substrate is very smallness with about 1.5%, and it is thought that there is no need for antireflection film processing on the rear face of a substrate.
[0018]
[Effect of the Invention] According to the projection TV which used this optic for the optic manufacture technique and the optic pan using an optic manufacturing installation and this of this invention, while a productivity is made good in a manufacture of an optic, the projection TV excellent in the optic which was excellent in the optical property, and also quality of image can be offered.

[Translation done.]

* NOTICES *

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the outline cross section in which showing the example of the gestalt of operation of this invention, and showing an example of a thin film deposition system.
[Drawing 2] An example of the configuration of the optic of this invention is shown and the outline configuration cross section of a dichroic mirror is shown.
[Drawing 3] It is an example of the optic of this invention and, in (a), the outline configuration plan of a pellicle beam splitter and (b) show the outline configuration side elevation of a pellicle beam splitter.
[Drawing 4] The outline state diagram of the theoretical permeability property of the dichroic mirror which is an example of the optic of this invention is shown.
[Drawing 5] The outline state diagram of the measurement result of the permeability property of the dichroic mirror which is an example of the optic of this invention is shown.
[Drawing 6] The outline state diagram of the measurement result of the permeability property of the dichroic mirror which is an example of the optic of the conventional example is shown.
[Description of Notations]
1 [-- A base material, 3b / -- Hard-coat layer,] -- An optical thin film deposition system, 2 -- Evacuation equipment, 3a 3c, 3c' -- A delivery roll, 5a, 5b, 5c, 5d, 5e, 5f / -- Guide roll,] -- A low refractive-index layer, 3d -- A quantity refractive-index layer, 4 6 [-- A plasma electrode, 9 / -- A gas introduction bulb, 10 / -- An optical monitor, 20 / -- A dichroic mirror, 21 / -- A transparent member, 22 / -- An adhesives layer, 30 / -- A pellicle beam splitter, 31 / -- Frame] -- A rolling-up roll, 7a, 7b -- An evaporation source, 8

[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The optic manufacturing installation carry out evaporating the aforementioned optical thin film raw material by the aforementioned vaporization means in the reduced-pressure ambient atmosphere, and forming an optical thin film on an aforementioned base material, providing the vaporization means evaporate an optical thin film raw material at least between the delivery roll which winds a base material, the rolling-up roll which roll round the aforementioned base material delivered from the aforementioned delivery roll, and the aforementioned delivery roll and the aforementioned rolling-up roll, and sending the aforementioned base material from the aforementioned delivery roll to the aforementioned rolling-up roll as the characteristic feature.
[Claim 2] The optic manufacturing installation according to claim 1 characterized by having a means by which the aforementioned vaporization means enables alternative vaporization of two sorts of aforementioned optical thin film raw materials from which a refractive index is different at least.
[Claim 3] One side of two sorts of aforementioned optical thin film raw materials from which the aforementioned refractive index is different is Si, Si oxide, and MgF2. It is the optic manufacturing installation according to claim 2 characterized by containing either and another side containing either Ti, Nb, Ti oxide and Nb oxide.
[Claim 4] The aforementioned optic manufacturing installation is an optic manufacturing installation according to claim 1 characterized by having a reactant gas introduction means to introduce reactant gas into the aforementioned interior of an optic manufacturing installation.
[Claim 5] The aforementioned optic manufacturing installation is an optic manufacturing installation according to claim 1 characterized by having the pressure regulation means of the aforementioned reduced pressure ambient atmosphere inside aforementioned] an optic manufacturing installation.
[Claim 6] The optic manufacturing installation according to claim 1 to which the aforementioned vaporization means is characterized by being any one sort in a vacuum evaporation system, electron-beam-evaporation equipment, a sputtering system, and an ion plating system.
[Claim 7] **** of the aforementioned delivery roll and the aforementioned rolling-up roll is an optic manufacturing installation according to claim 1 characterized by having at least 100mm diameter.
[Claim 8] The optic manufacturing installation according to claim 1 characterized by having the protection film with which the aforementioned base material was formed on the adhesives layer formed in the opposite side of the aforementioned optical thin film forming face, and the aforementioned adhesives layer.
[Claim 9] The optic manufacturing installation according to claim 1 characterized by the aforementioned base material having the hard-coat layer beforehand formed in the aforementioned optical thin film forming face.
[Claim 10] The optic manufacturing installation according to claim 1 to which the aforementioned base material is characterized by being any one sort of high polymer films of a polyethylene terephthalate, polyethylenenaphthalate, polymethylmethacrylate, and the polycarbonates.
[Claim 11] The optic manufacture technique characterized by having the process which an optical thin film raw material is evaporated in the reduced pressure ambient atmosphere, and forms an optical thin film on the aforementioned base material, rolling round from a roll and sending [send a base material,] to a roll at least.
[Claim 12] The optic manufacture technique according to claim 11 characterized by having the process which joins the aforementioned base material to a transparent member, and the process which judges the aforementioned base material in a predetermined configuration after the process which forms the aforementioned optical thin film on the aforementioned base material.
[Claim 13] The optic manufacture technique according to claim 12 characterized by the aforementioned transparent member being tabular glass.
[Claim 14] The optic manufacture technique according to claim 12 characterized by having the process which forms a protection film on an adhesives layer and the aforementioned adhesives layer before the process which forms the aforementioned optical thin film at at least 1 principal plane of the aforementioned transparent member.
[Claim 15] The optic manufacture technique according to claim 11 characterized by having the process which joins the aforementioned base material to a frame, and the process which judges the aforementioned base material in a predetermined configuration after the process which forms the aforementioned optical thin film.

[Claim 16] The optic manufacture technique according to claim 11 that the process which forms the aforementioned optical thin film is characterized by evaporating alternatively two sorts of aforementioned optical thin film raw materials from which a refractive index is different at least.
[Claim 17] One side of two sorts of aforementioned optical thin film raw materials from which the aforementioned refractive index is different is Si, Si oxide, and MgF2. It is the optic manufacture technique according to claim 16 characterized by containing either and another side containing either Ti, Nb, Ti oxide and Nb oxide.
[Claim 18] The optic manufacture technique according to claim 11 that the process which forms the aforementioned optical thin film is characterized by using any one sort in a vacuum deposition method, an electron-beam-evaporation method, the sputtering method, and the ion-plating method.
[Claim 19] The optic manufacture technique according to claim 16 characterized by having the process to which the process which forms the aforementioned optical thin film carries out 10 stratification of two sorts of optical thin films from which the aforementioned refractive index is different at least by turns, respectively.
[Claim 20] The optic manufacture technique according to claim 11 that the process which forms the aforementioned optical thin film is characterized by having the reactant gas introduction process which introduces reactant gas.
[Claim 21] The optic manufacture technique according to claim 11 that the process which forms the aforementioned optical thin film is characterized by having the pressure regulation process of the aforementioned reduced pressure ambient atmosphere.
[Claim 22] The optic manufacture technique according to claim 11 that the aforementioned base material is characterized by being any one sort of high polymer films of a polyethylene terephthalate, polyethylenenaphthalate, polymethylmethacrylate, and the polycarbonates.
[Claim 23] The optic manufacture technique according to claim 11 characterized by having the process which forms a protection film in the opposite side of the aforementioned optical thin film forming face of the aforementioned base material on an adhesives layer and the aforementioned adhesives layer in front of the process which forms the aforementioned optical thin film, and at either the back.
[Claim 24] The optic manufacture technique according to claim 11 characterized by having the process which forms a hard-coat layer beforehand before the process which forms the aforementioned optical thin film at the aforementioned optical thin film forming face of the aforementioned base material.
[Claim 25] The optic manufacture technique according to claim 12 characterized by the refractive index of the aforementioned base material and the refractive index of the aforementioned transparent member being almost the same
[Claim 26] The optic produced using the base material in which the optical thin film produced by the optic manufacturing installation according to claim 1 was formed.
[Claim 27] The optic according to claim 26 characterized by the aforementioned optic being any one sort in a dichroic mirror, an edge filter, a band pass filter, the parts with an antireflection film, and a pellicle beam splitter.
[Claim 28] The optic produced using the base material in which the optical thin film produced by the optic manufacture technique according to claim 11 was formed.
[Claim 29] The optic according to claim 28 characterized by the aforementioned optic being any one sort in a dichroic mirror, an edge filter, a band pass filter, the parts with an antireflection film, and a pellicle beam splitter.
[Claim 30] Projection TV characterized by using a dichroic mirror according to claim 27.
[Claim 31] Projection TV characterized by using a dichroic mirror according to claim 29.

[Translation done.]